What is claimed is:

1. A method for producing an optical fluoride crystal, comprising:

translating a crucible containing a molten crystal raw material from a first zone, through a thermally-graded zone, into a second zone to form a crystal; and

controlling a temperature of at least one of the first zone and second zone such that an effective radial temperature gradient at a point in the thermally-graded zone where the crystal is formed does not exceed 5 °C/cm.

2. The method of claim 1, wherein controlling the temperature of at least one of the first zone and second zone comprises controlling a heating element in the second zone.

3. The method of claim 1, wherein controlling the temperature of at least one of the first zone and second zone comprises heavily insulating the second zone.

4. The method of claim 1, further comprising controlling a temperature difference between the first zone and the second zone such that an effective axial temperature gradient in the thermally-graded zone does not exceed 10 °C/cm.

5. The method of claim 4, wherein controlling the temperature difference between the first zone and the second zone comprises controlling a heating element in the second zone.

6. The method of claim 4, wherein controlling the temperature difference between the first zone and the second zone comprises heavily insulating the second zone.

7. The method of claim 1, wherein the first zone is maintained at a temperature above a melting point of the crystal raw material.

8. The method of claim 7, wherein the second zone is maintained at a temperature below a melting point of the crystal raw material.

9. The method of claim 8, wherein the temperature in the second zone is maintained in a range from 100 to 550 °C below a melting point of the crystal raw material.

10. The method of claim 1, further comprising cooling the crystal in the second zone. The method of claim 10, wherein cooling the crystal comprises cooling the crystal at a rate less than 15 °C/h.

11. The method of claim 10, wherein a cooling rate of the crystal from a temperature above 700 °C is no greater than 2.5 °C/h.

12. The method of claim 10, wherein a cooling rate of the crystal from a temperature above 550 °C is no greater than 5 °C/h.

13. The method of claim 10, wherein a cooling rate of the crystal from a temperature above 400 °C is no greater than 10 °C/h.

14. The method of claim 1, wherein a translation rate of the crucible is 2.5 mm/hr.

15. The method of claim 1, wherein the crystal raw material comprises one selected from the group consisting of CaF_2, BaF_2, SrF_2, LiF, MgF_2, NaF, and mixtures thereof.

16. The method of claim 1, wherein the crucible comprises a stack of bowls, each of which contains a portion of the molten crystal raw material.

17. A method for producing an optical fluoride crystal, comprising:

translating a crucible containing a molten crystal raw material from a first zone, through a thermally-graded zone, into a second zone to form a crystal; and

controlling a temperature of at least one of the first zone and the second zone such that an effective radial and axial temperature gradient at a point in the thermally-graded zone where the crystal is formed does not exceed 5 °C/cm and 10 °C/cm, respectively.